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Regulation 3.2

AUSTRALIA

Patents Act 1990

**ORIGINAL
COMPLETE SPECIFICATION
STANDARD PATENT**

Invention Title: "IMPROVED HAND PUFFER"

The following statement is a full description of this invention, including the best
method of performing it known to me/us:

ABSTRACT

An improved hand puffer for dispensing particulate material, such as insecticidal dust. The hand puffer comprises a resiliently deformable bulb communicating with a hollow stem. A one-way closure
5 means consisting of a valve and fine filter allows air into the bulb but prevents dust from escaping from the bulb through the closure.

The stem extends into the bulb and has a pair of openings that allow particulate material into the stem, whatever the orientation of the bulb.

10 The improved hand puffer offers advantages in safety compared to prior art puffers.

EXPLANATORY NOTE

An improved hand puffer (1) for dispensing particulate material, such as insecticidal dust. The hand puffer comprises a resiliently deformable bulb (2) communicating with a hollow stem (3). A one-way closure means (4) consisting of a valve and fine filter allows air into the bulb but prevents dust from escaping from the bulb through the closure.

The stem extends into the bulb and has a pair of openings (10) that allow particulate material into the stem, whatever the orientation of the bulb.

The improved hand puffer offers advantages in safety compared to prior art puffers.

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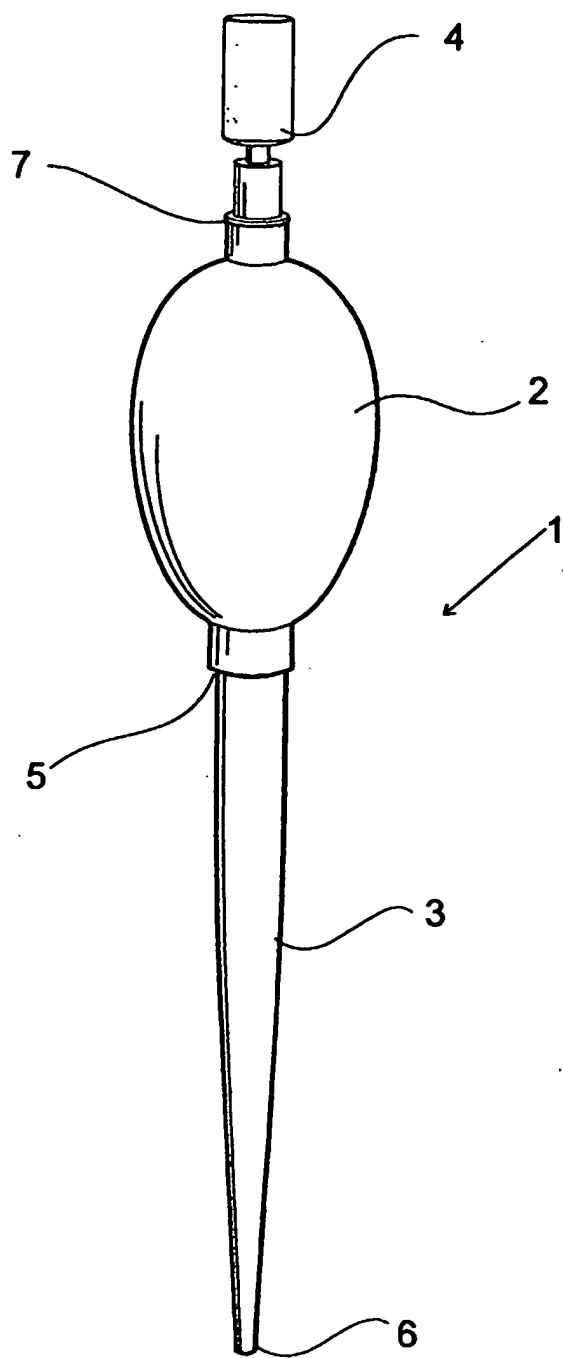


FIG. 1

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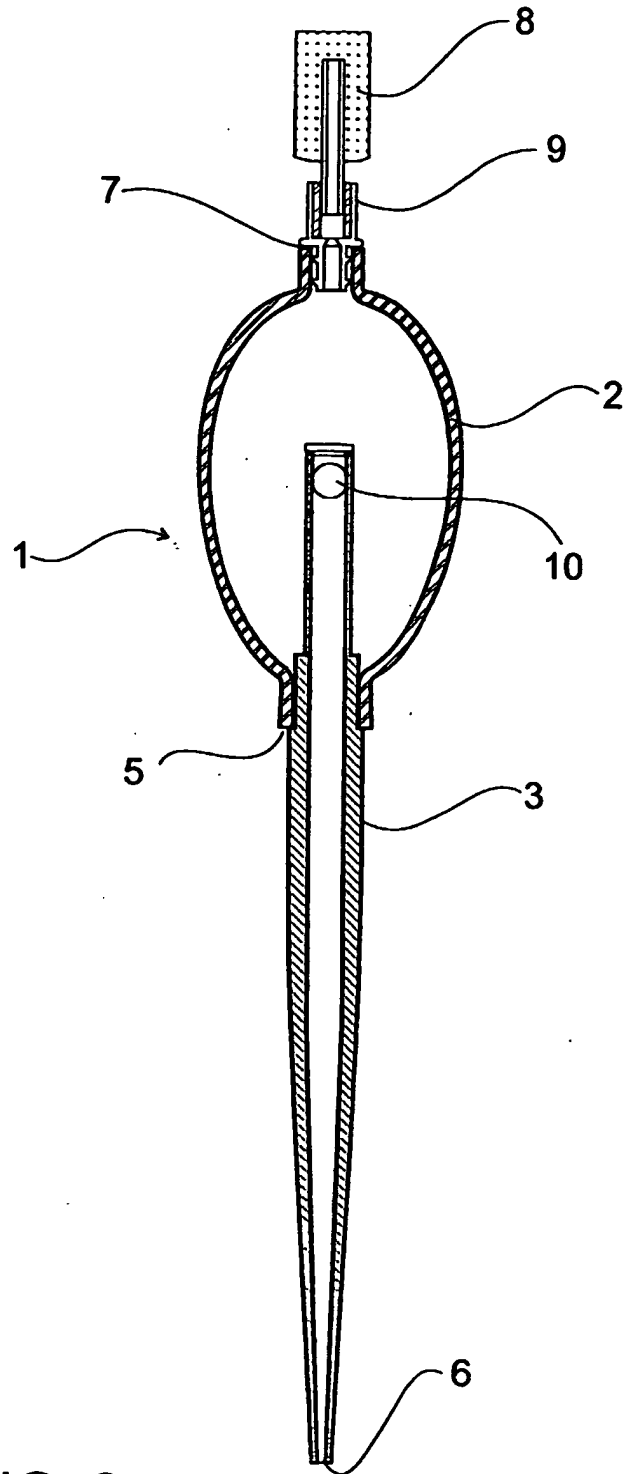


FIG. 2

IMPROVED HAND PUFFER

The invention relates to a hand puffer for delivering insecticidal dust formulations and other particulate materials. In particular, the invention relates to a hand puffer that provides improved delivery of dust
5 compared to prior art puffers.

BACKGROUND TO THE INVENTION

It is known to use insecticidal dust formulations to treat against insect infestation. Dust formulations and particulates for insect control
10 vary greatly according to the type of insect and the situation requiring control. The most common insecticidal dust formulation for the treatment of termites in buildings is arsenic trioxide dust.

Typically, the dust is delivered by a licensed tradesperson to an area of damaged wood containing termite activity. The dust is puffed into
15 the active termite gallery systems through a series of small holes drilled or punched through the outer layer of undamaged wood (often only a thin veneer of wood or paint remains after termite excavation). It is of the highest importance for the dust to penetrate the gallery systems completely to provide the greatest chance for success.

20 The most common method of delivering dust is to half fill a hand puffer with the dust and to deliver the dust to the treatment site through a hollow stem connected to the puffer. A typical puffer is a generally

elongate, resiliently deformable bulb having an open mouth at one end. A hollow stem is removably sealed to the open mouth for dispensing of the dust. Compression of the puffer dispenses dust through the stem.

It is common to use available blood pressure bulbs as the puffer.

- 5 Blood pressure bulbs have a valve at one end that allows the bulb to refill with air when the pressure deforming the bulb is released. For pest control applications the valve is purposefully blocked due to the risk of arsenic dust escaping through the valve.

- Blocking of the air intake valve means that when the puffer is in use the air to refill the puffer bulb must be drawn back through the stem. This causes a slight vacuum at the application point resulting in the dust flow stopping within the gallery system and being drawn back to the application point. An additional problem with the lack of a rear air intake is that upon release of the bulb during application the stem is emptied of airborne dust resulting in the requirement to shake the puffer every few depressions of the bulb to maintain adequate dust flow. Arsenic dust being of a dense mass is quite heavy and tends to fall out of air suspension within termite galleries quickly, therefore speed combined with thoroughness of penetration is of greatest importance.
- 15

- 20 It is common for the stem within typical puffers to have an open end that the dust is picked up inside the puffer body and delivered through. This open end results in the typical puffer not performing

correctly unless the puffer is used in such a way as to maintain the tip of the puffer above the horizontal position to the body. Failing to do this will result in over application of dust.

5 OBJECT OF THE INVENTION

It is an object of the present invention to provide an improved hand puffer that overcomes one or more of the identified deficiencies in the known prior art.

Further objects will be evident from the following description.

10

DISCLOSURE OF THE INVENTION

In one form, although it need not be the only or indeed the broadest form, the invention resides in an improved hand puffer comprising:

15 a resiliently deformable bulb having a first opening and a second opening;

a stem communicating with said first opening for dispensing of particulate material from within the bulb;

a one way closure means closing said second opening, the one
20 way closure means permitting ingress of air but substantially preventing egress of the material held in the bulb.

In preference the first and second openings are located in

diametrically opposed positions.

The stem is preferably inserted into the first opening and extends to a position approximately central to the bulb. Suitably the stem is hollow and has one or more material intakes formed in the end located within
5 the bulb.

The one way closure means preferably comprises a filter having a pore size that allows passage of air but prevents passage of particulate material. The one way closure means may also include a one way valve.

10 BRIEF DETAILS OF THE DRAWINGS

To assist in understanding the invention preferred embodiments will now be described with reference to the following figures in which :

- FIG 1 is a perspective view of an improved hand puffer;
- FIG 2 is a cross-sectional side view of a first embodiment of an
15 improved hand puffer;
- FIG 3 is a cross-sectional side view of a second embodiment of an improved hand puffer;
- FIG 4 is a cross-sectional side view of the second embodiment during compression of the bulb; and
- 20 FIG 5 is a cross-sectional side view of the second embodiment during expansion of the bulb

DETAILED DESCRIPTION OF THE DRAWINGS

In the drawings, like reference numerals refer to like parts. In Fig 1 there is shown a hand puffer 1, consisting of a resiliently deformable bulb 2, a stem 3 and a closure means 4.

5 The bulb 2 is conventionally made from rubber or a similar synthetic material. It has a first opening 5 that receives one end of the stem 3. The open end 6 of the stem 3 delivers dust from the bulb 2. The second opening 7 of the bulb 2 is closed by closure means 4 that allows air to enter the bulb but prevents particulate matter in the bulb, such as
10 arsenic dust, from escaping.

 A first embodiment of the improved hand puffer 1 is shown in greater detail in Fig 2. In Fig 2 it can be seen that the closure means 4 is a filter 8. The filter is suitably a ceramic material having a pore size sufficiently small to capture the material held within the bulb yet allow air
15 to enter the bulb. The inventor has found that a small ceramic filter commonly used in fish tank aerators is suitable. A plug 9 is shown in Fig 2 for fitting the filter 8 to the bulb 2. It will be appreciated that other filters and fittings will be suitable for the purpose.

 As can be seen in Fig 2, the stem is hollow and extends
20 approximately half way into the bulb. The end of the stem within the bulb has a port 10 through which dust from the bulb enters the stem. It will be appreciated that dust will enter the stem irrespective of the orientation of

the stem with respect to the horizontal. Furthermore, since air enters the bulb through closure means 4, the material within the stem 3 will not be cleared by incoming air, as is the case in prior art hand puffers. This leads to safer and more efficient delivery of insecticidal dusts and

5 minimises the dangers of using arsenic dust.

A second embodiment of an improved hand puffer is shown in Fig 3. The embodiment of Fig 3 is identical to the embodiment of Fig 2, except a ball 11 has been incorporated into the plug 9 to form a one-way valve. The ball 11 is constrained to move between seat 12 and stop 13.

10 The operation of the one-way valve is described in greater detail with reference to Fig 4 and Fig 5.

The advantage of the improved hand puffer is best seen in Fig's 4 and 5. Referring to Fig 4, the bulb 2 is normally filled with particulate material, such as arsenic dust. When the bulb 2 is squeezed in the

15 directions of arrows 14, dust 15 is forced into port 10, down stem 3 and out through the open end 6, as shown by arrows 16.. The ball 11 is forced against seat 12 thereby sealing the opening 7. A small amount of dust will inevitably escape through opening 7, but this is captured by filter

8.

20 When the bulb 2 is released, it expands in the direction of arrows 17. Air is drawn into the bulb through filter 8 and past ball 11, as shown by arrows 18. Ball 11 is forced down against stop 13, as shown. Dust 15

remains in stem 3 so that on the next compression of the bulb it is delivered, irrespective of the orientation of the puffer.

It will be appreciated that the improved puffer can be used in any orientation. If the stem is pointing above the horizontal, the dust will
5 settle towards the closure means 4. However, dust will not escape from the bulb. Because air is not being drawn through the stem, a considerable amount of dust will remain in the stem, irrespective of the stems orientation, and be delivered when the bulb is compressed. The
10 need to shake the puffer to fill the stem is substantially reduced or removed.

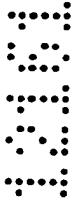
The safety of the user of the hand puffer is greatly improved since turbulence in the vicinity of the open end 6 of the stem 3 is reduced. Furthermore, the closure means prevents dust escaping into the face of the user. The extension of the stem 3 into the center of the bulb 2 means
15 that the puffer can be easily used in any orientation, which also improves the safety for the user.

Throughout the specification the aim has been to describe the preferred embodiments of the invention without limiting the invention to any one embodiment or specific collection of features.

CLAIMS

1. An improved hand puffer comprising:
a resiliently deformable bulb having a first opening and a second opening;
- 5 a stem communicating with said first opening for dispensing of particulate material from within the bulb;
a one way closure means closing said second opening, the one way closure means permitting ingress of air but substantially preventing egress of the material held in the bulb.
- 10 The improved hand puffer of claim 1 wherein the first and second openings are located in diametrically opposed positions.
3. The improved hand puffer of claim 1 wherein the stem is inserted into the first opening and extends to a position approximately central to the bulb.
- 15 4. The improved hand puffer of claim 1 wherein the stem is hollow and has one or more material intakes formed in an end located within the bulb.
5. The improved hand puffer of claim 1 wherein the one way closure means comprises a filter having a pore size that allows passage of air but
20 prevents passage of particulate material.
6. The improved hand puffer of claim 1 wherein the one way closure means comprises a one way valve.

7. An improved hand puffer as herein described with reference to the drawings.



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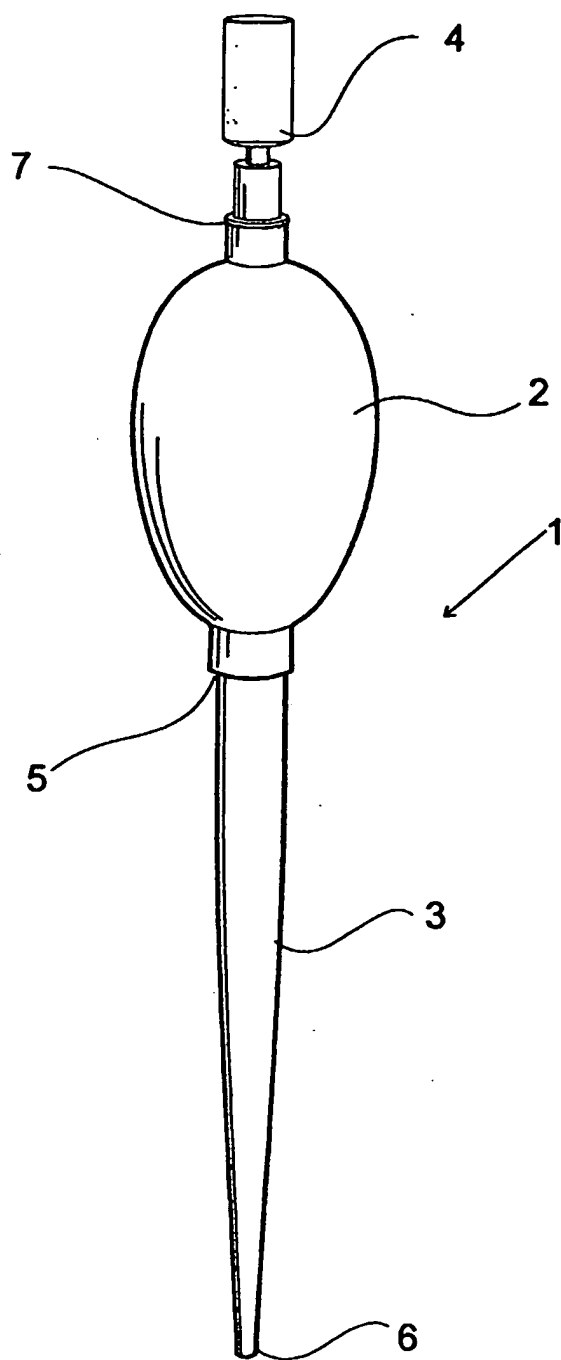


FIG. 1

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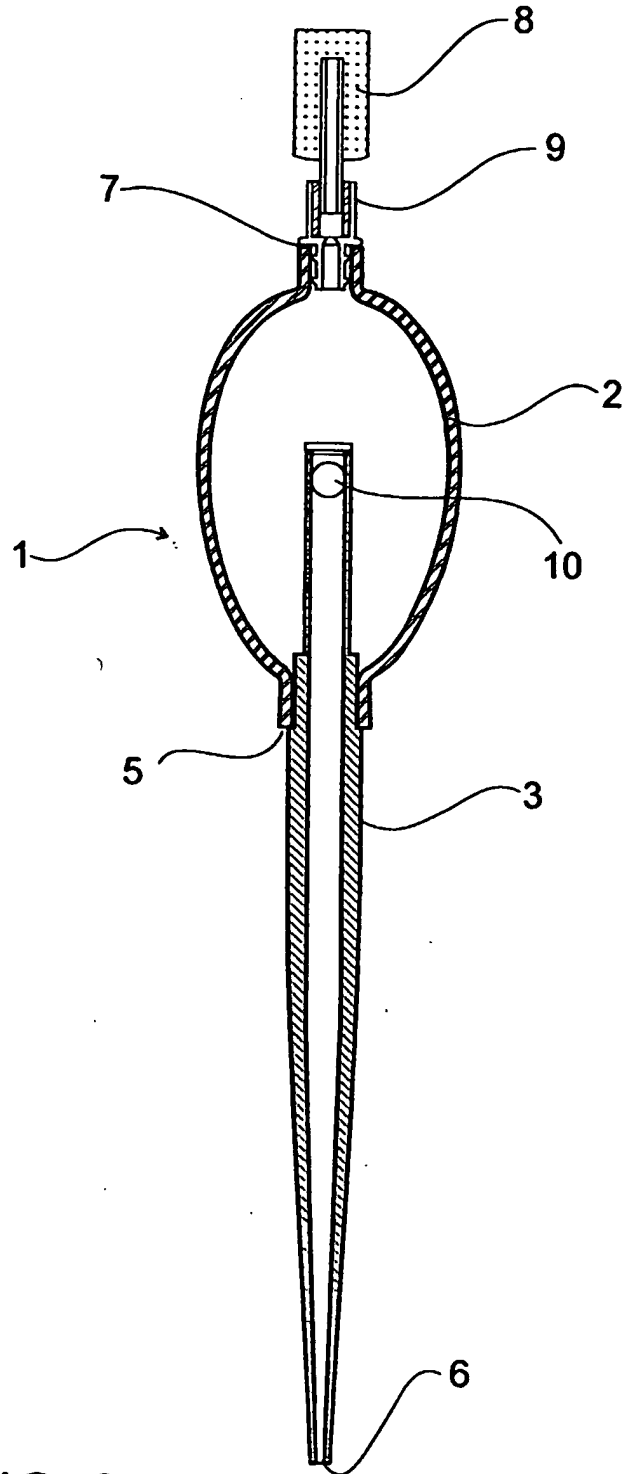


FIG. 2

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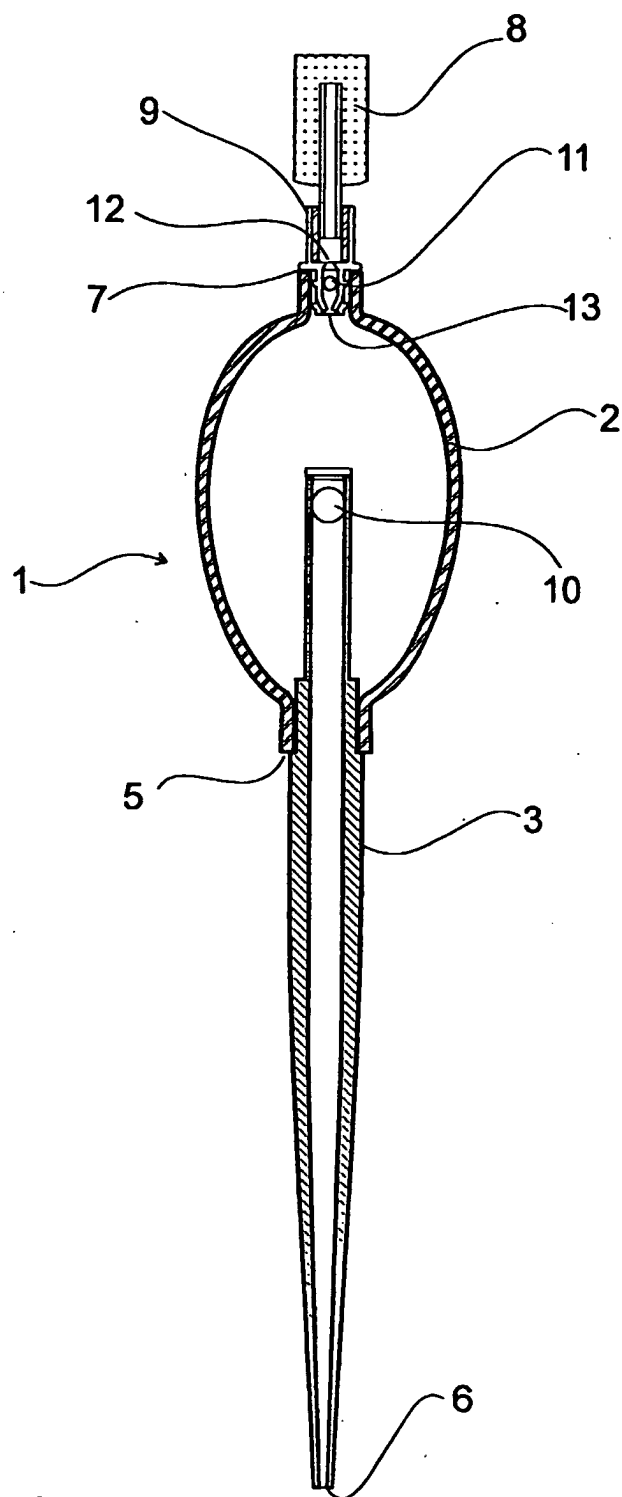


FIG. 3

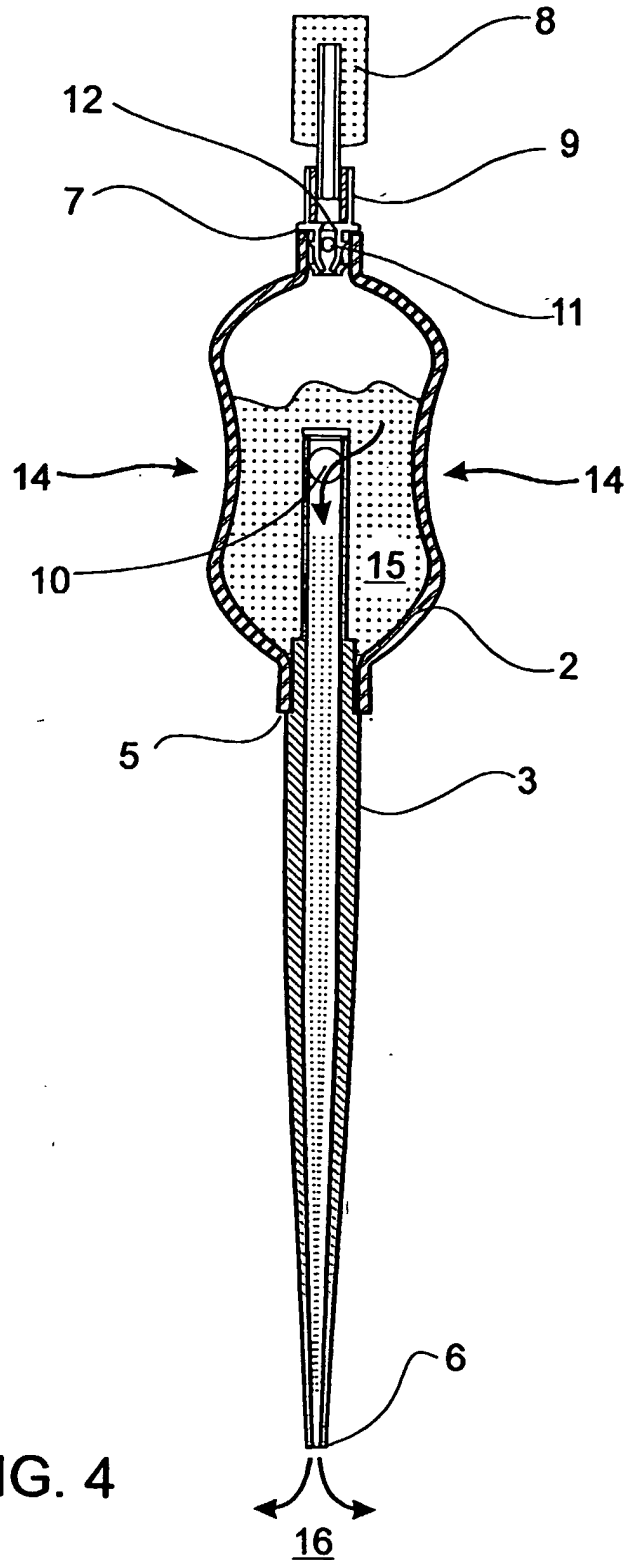


FIG. 4

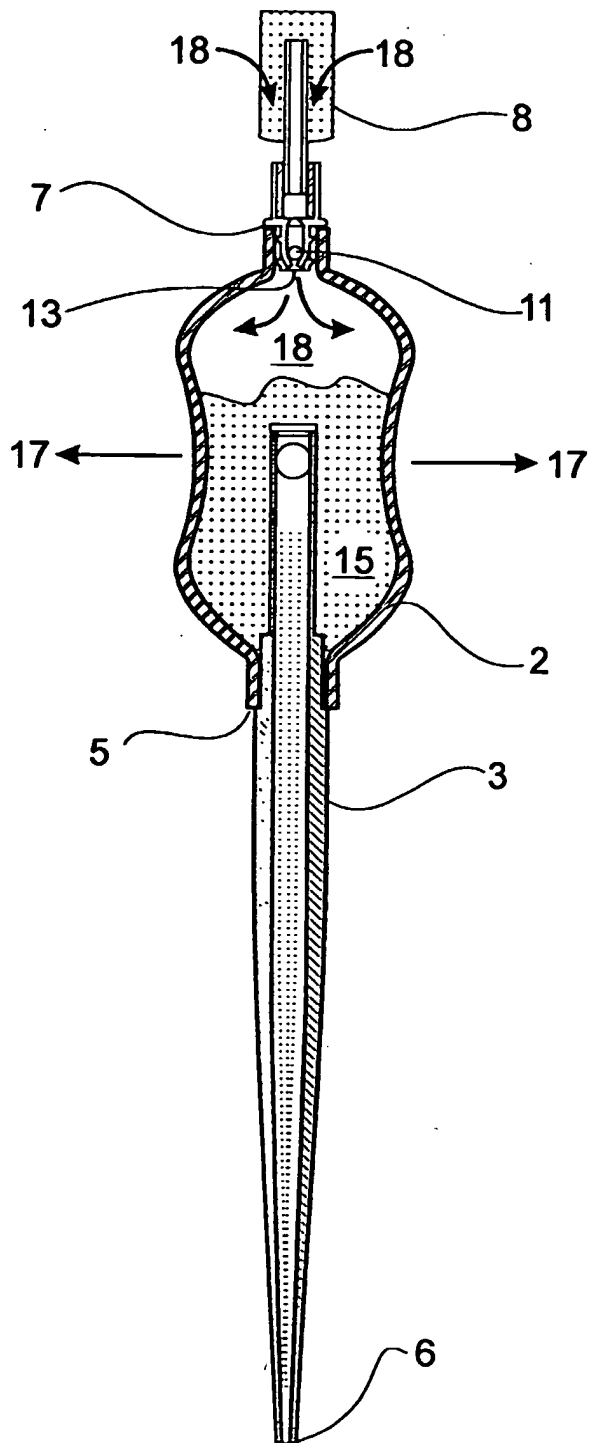


FIG. 5

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